CHAPTER 2
A.R.I.18146

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Introduction

1. A.R.I.18146 fitted to the Vulcan aircraft by Mod.2024 and modified by Mod.2304 and 2369 is a barrage jammer operating on X band frequencies.

2. The A.R.I. is interconnected with the A.R.I.5952 described in Sect.9, Chap.8.

3. Illustrations showing equipment locations are provided and a routing chart of the system will be found at the end of the text.

3A. Mod.2468 introduces an additional core to connector Part No.12/T5510 to permit correct functioning of the A.R.I.18146 with RMC modifications A5286, A5287 and A5288 embodied.

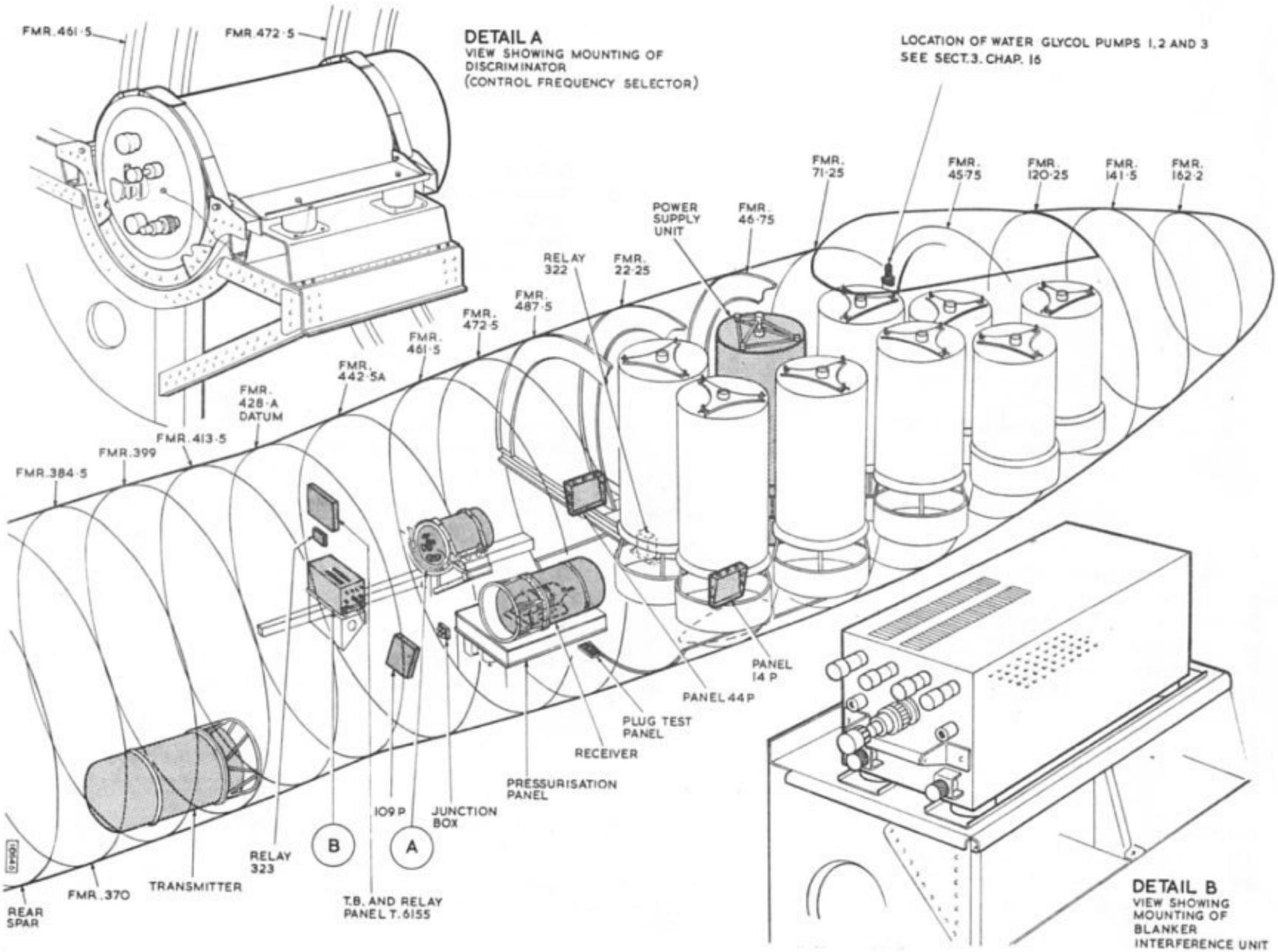

Fig. 1 Location of equipment

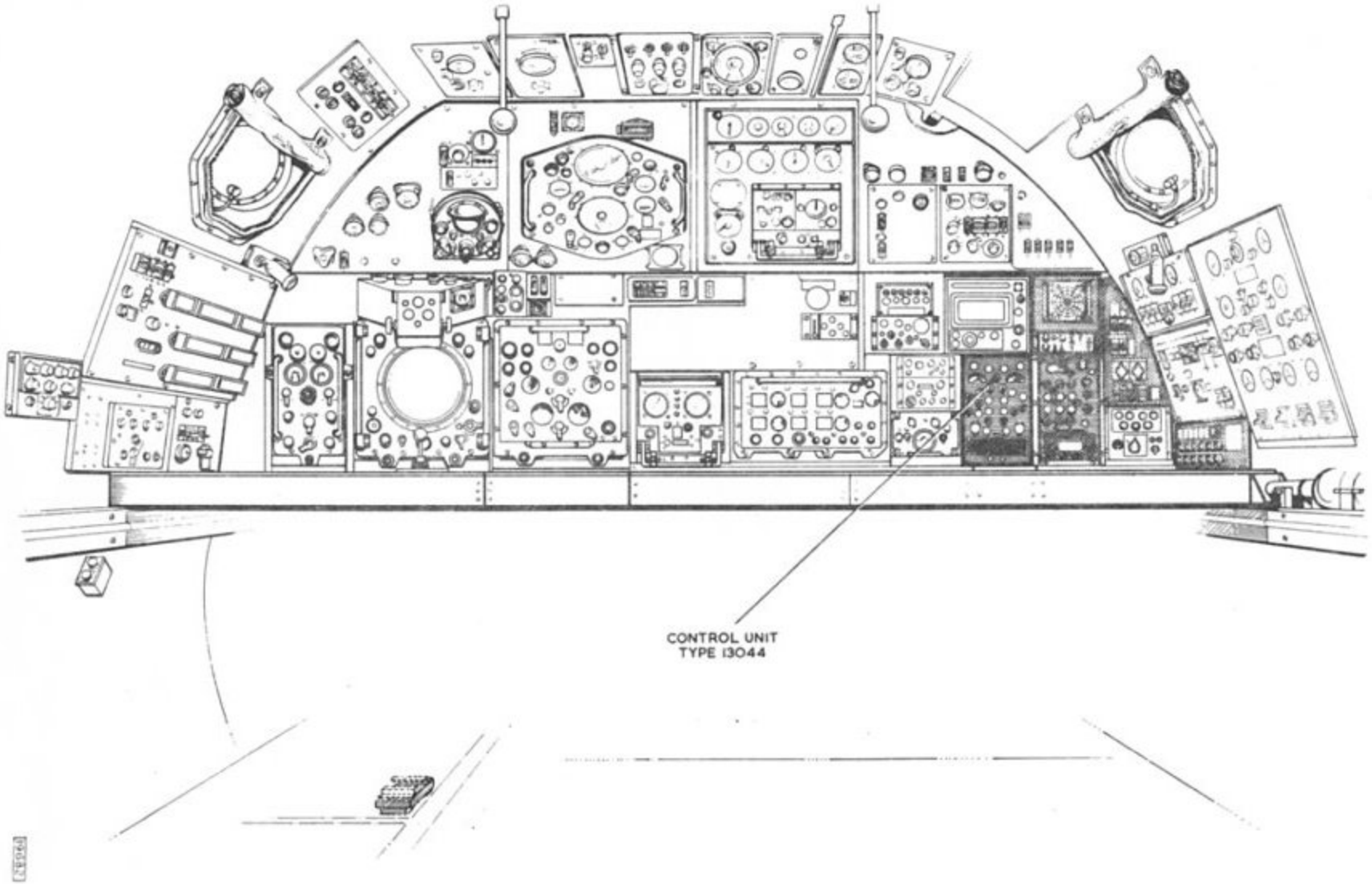

Fig. 1A Crew station equipment

DESCRIPTION

DETAILS OF UNITS

4. The following items of equipment comprise the A.R.I. and are located as shown in fig.1, 1A, 2 and 5.

Transmitter Radio	5895-99-913-1187
Power Supply Set	5895-99-945-2035
Control Unit	5895-99-945-5125
Receiver, Radar	5895-99-946-5122
Blanker, Interference	5895-99-947-3004
Power, Monitor	5895-99-945-5355
Directional Coupler	5895-99-945-5359
Test Switch	5895-99-945-5354
Aerials (2)	5895-99-946-5121
Control, Frequency Selector	5895-99-946-5358
Directional Coupler, Power Monitor	5895-99-945-5355
Directional Coupler, RF Power	5895-99-945-5359
Waveguide Test Point	5895-99-945-5356
Waveguide Switch	110F/0688089

Transmitter

5. The transmitter of cylindrical construction (fig.1) is mounted horizontally in a cradle suspended on a resilient mounting at former 384.5. The unit is secured by two strap assemblies to the cradle which in turn is secured to mountings by two quick release pins. A bracket and pulley fitted to the fuselage above the transmitter enable it to be installed and removed complete with cradle by a minihoist. Details will be found in Sect.3, Chap.16 of this publication.

Receiver

6. The receiver of cylindrical construction is strapped to a cradle on resilient mountings at former 46.5 on the port side of the fuselage.

Discriminator unit

7. The discriminator (control frequency selector), is strapped to a cradle (similar to the receiver) at former 461.5 on the starboard side of the fuselage.

Blanker interference unit

8. The blanker interference unit is fitted on a resilient mounting tray at former 428.

Aerials

9. The aerials are fitted to a bracket attached to the forward main access door at former 22.25 (fig.2). The assembly is enclosed by a small radome and a streamlined removable fairing. Two round access panels are provided to enable the waveguides to be disconnected when it is required to lower the main door.

Control unit

10. All the controls necessary for the normal operation of the equipment are contained in the control unit (fig.5).

11. Connection between the control unit and the equipment in the rear fuselage is via a relay and T.B. panel at former 428A and a junction box Part No. T.6158 at former 472.5 (fig.8).

Test sockets

12. Two test sockets for the system, labelled A and 6G are fitted on a bracket at former 487.5 (fig.8). Each socket is provided with a protective cap.

Power unit

13. The power unit of cylindrical construction (canister) is fitted between formers 22.25 and 46.75. Fitting details can be found in Chap.1 of this section.

Pressurization of units

14. The container of the power unit, transmitter, receiver and control frequency selector are pressurized with nitrogen at

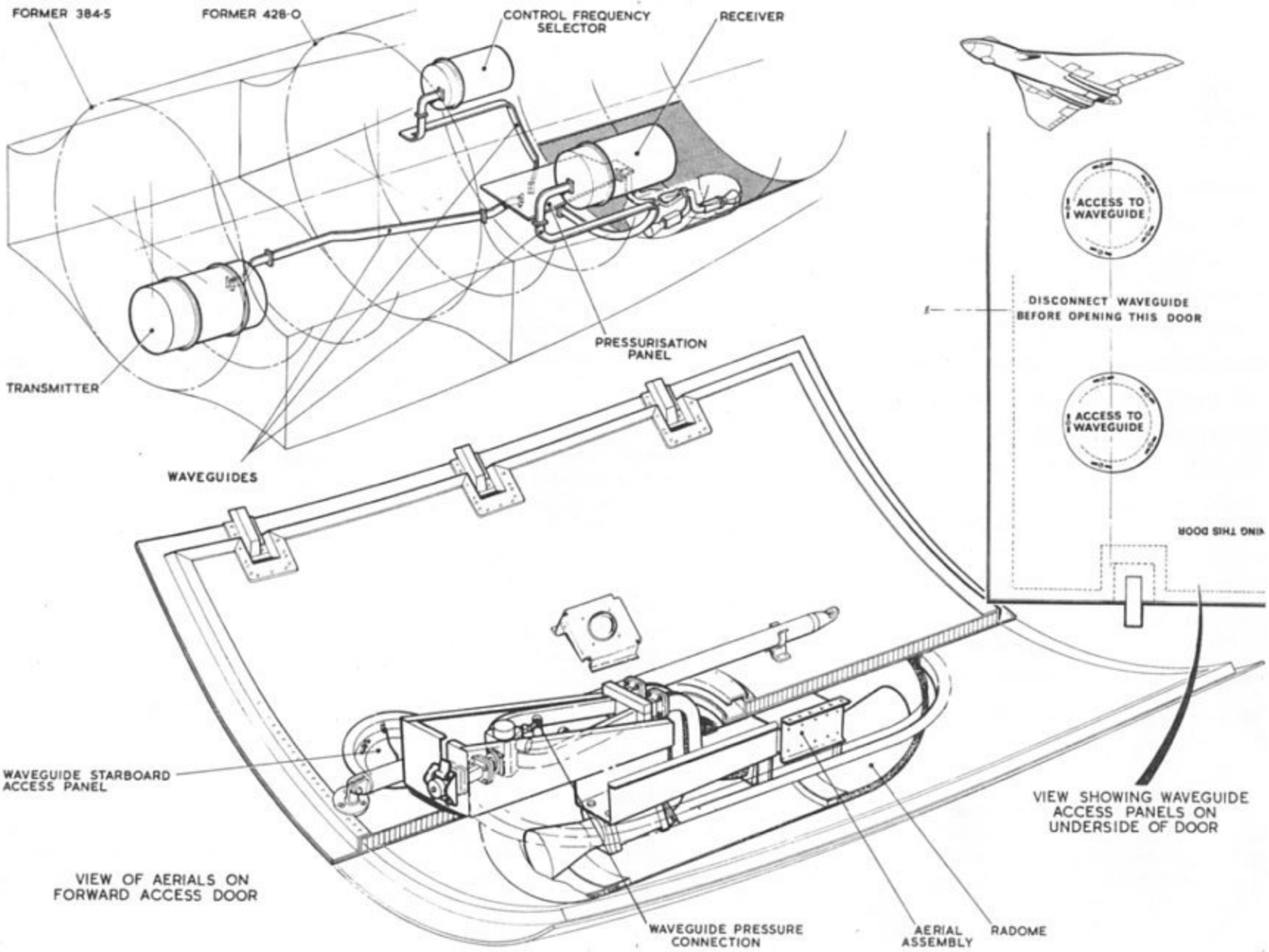

Fig. 2 Waveguide and aerial installation

5 lb/in^2. A Schrader pressurizing valve is provided on each unit.

Waveguides

▶ 15. Pressurized waveguides connect the transmitter receiver and control frequency selector to the aerials via couplers on the pressurization panel. The main waveguide runs are of rigid rectangular cross-section construction which terminate at the units in a short flexible waveguide. The waveguides are easily disconnected when it is desired to remove the units. When being installed, units with waveguide connections must be accurately positioned to line up with the waveguide flanges. This applies particularly to the transmitter, receiver and control frequency selector for which correct alignment positions are shown in fig.4. ◀

Pressurization panel

▶ 16. The pressurization panel provides a low pressure supply of nitrogen for the waveguides. The panel is mounted face downwards between formers 461.5 and 487.5 and contains the necessary control valves for the system. The following components are mounted on the panel and connected by waveguide sections:- ◀

Directional coupler, power monitor
Directional coupler, R.F. power
Aerial switch
Waveguide test switch
Waveguide test point. Pressure seal.

A storage bottle fitted into a cradle on the starboard side, between formers 461.5 and 487.5, supplies a high pressure connector block with nitrogen at 1 800 lb/in^2.

Power supplies

▶ 17. Power supplies for the installation are fed from the 200-volt a.c. fuses 117 R.Y. and B in panel 60P via contactor 323 at former 428. When the push-switch on control panel 81P is pressed, contactor 323 will be energized to connect the supplies to the respective distribution fuses in panel 109P. This action is simultaneous with that of contactor 620, which is energised to connect the supplies of A.R.I.18076 (Chap.4). Supplies at 28-volt d.c. are fed from fuses 664 and 1393 in panels 3P and 26P respectively. Full details of the power supplies will be found in Sect.6, Chap.22 of this publication. ◀

▶ 18. A full description of the A.R.I. together with testing and setting up instructions will be found in A.P.116F-0109-1. ◀

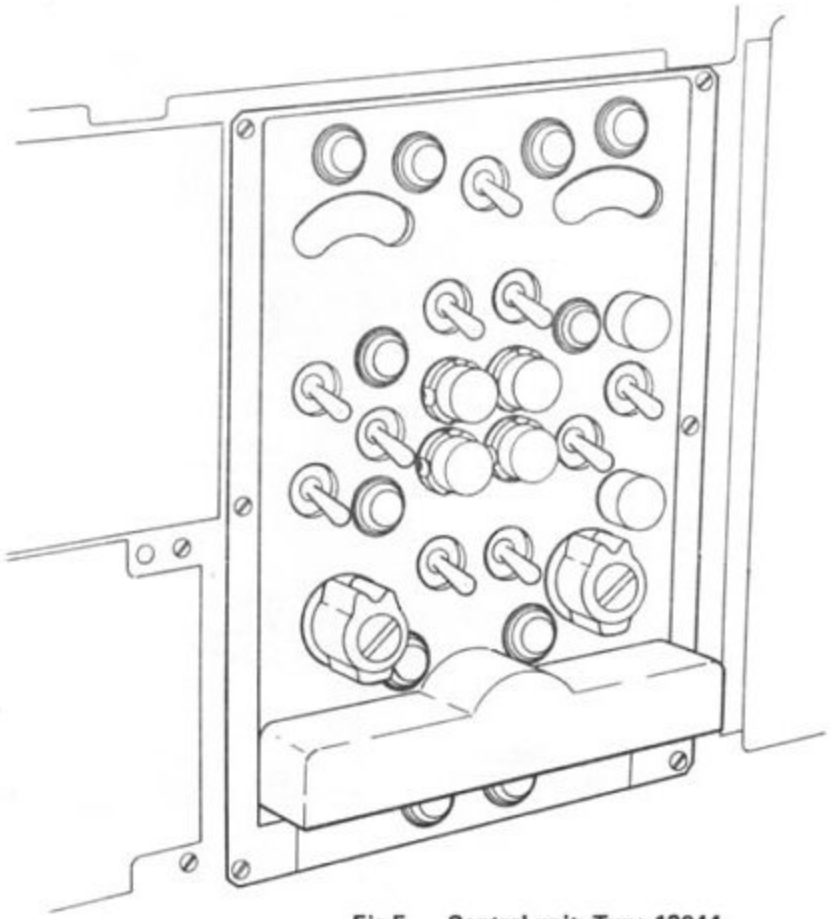

Fig.5 Control unit, Type 13044 10434
Title changed

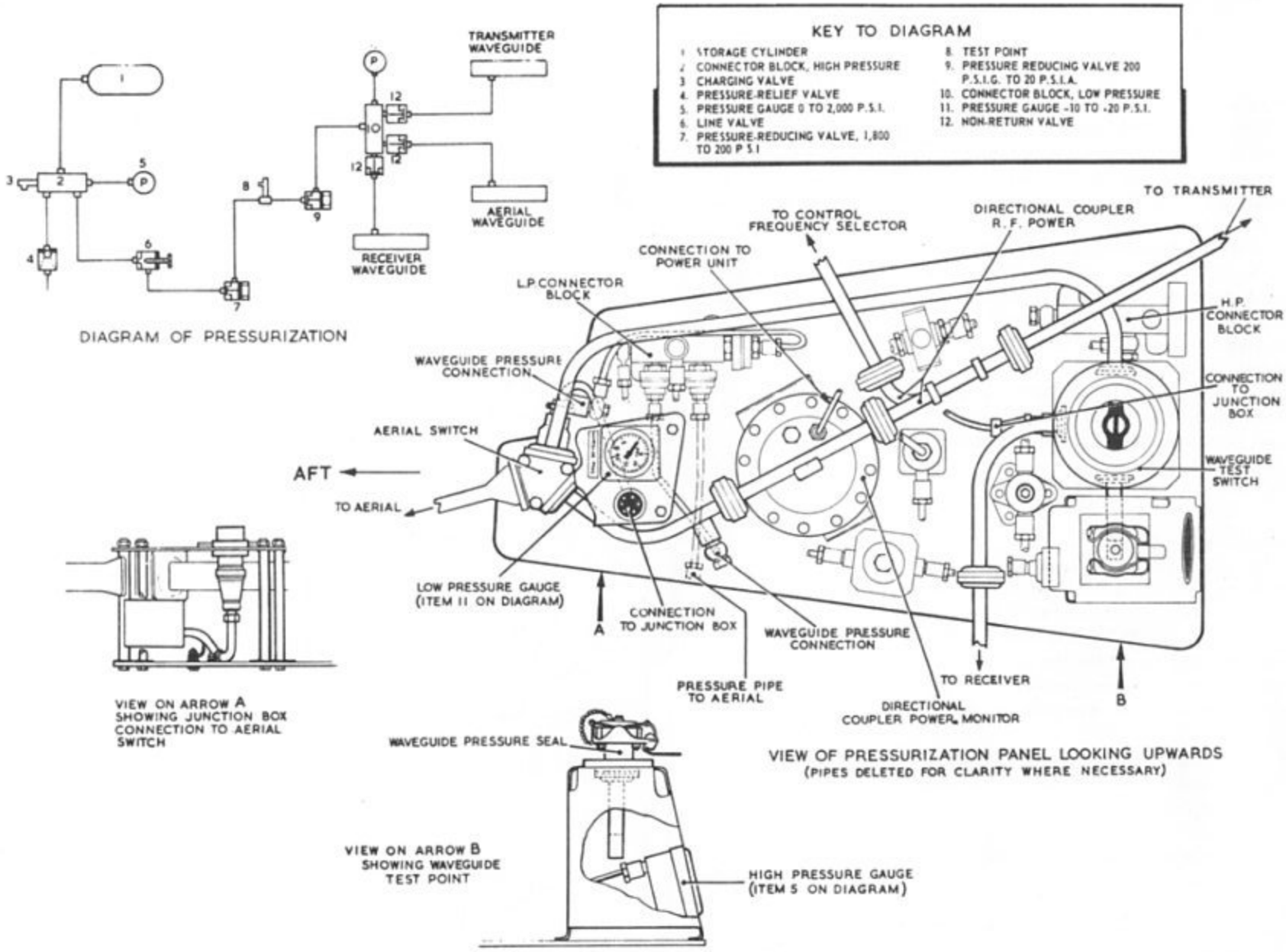

Fig.6 Pressurization panel

TABLE 1

Connectors for A.R.I.18146

Part No.	Cableform	No.of Cores	Wiring pin to pin End A to End B	Connecting End A	Connecting End B
3/T5510	Uniradio 70	1	–	Tee piece in nose	Modulator plug 604
4/T5510	Uniradio 70	1	–	Plug 1,002	Tee piece in nose
5/T5510	Uniradio 70	1	–	Plug 1,002	Plug 199
6/T5510	Nyvin 22	7	A D E F G H J	Control unit 4C	Plug 1207
			BC, I end A to K end B		
	Nyvinmetsheath 22	3	Screens to L end B only		
	Nyvin 22	28			
7/T5510 *	Nyvin 16	4	Table 2	Control unit 4A	Plug 646; T.B.1741; T.B.1742
	Nyvinmetsheath 22	2			
8/T5510	Uniradio 70	1	–	Plug 199	Blanking unit H2S
9/T5510	Uniradio 70	1	–	Blanking unit GS	A.R.I.5952 test point
10/T5510	Uniradio 43	1	–	Power unit 2L	Control frequency selector 3F
11/T5510	Nyvin 22	7	A D E F G H J B C K	Plug 1207	Plug 1208
	Nyvinmetsheath 22	3	Screens to L		
▶ 12/T5510	Nyvin 22	12	A B C D E F H J K N S T	Power unit 2K	Control frequency selector 3G ◀
	Nyvin 16	2	G P		
13/T5510	Nyvin 22	20	E K L M N R S T U V W X Z a c d e f p r	Power unit 2G	Transmitter 1E
	Nyvinmetsheath 22	1	Screen to shells		
14/T5510	P.E.T. 3/1/P Special	1	–	Power unit 2H	Transmitter 1A
15/T5510	Uniradio 43	1	–	Power unit 2J	Transmitter 1B
16/T5510	Uniradio 43	1	–	Power unit 2B	Transmitter 1C
17/T5510	Uniradio 70	1	–	Transmitter 1G	Power unit 2D
18/T5510	Uniradio 43	1	–	Power unit 2F	Directional coupler power monitor 5A
▶ 19/T5510 *	Nyvin 22X	7	Table 2	Plug 1208	J.B. plug 1211; T.B.1751 ◀
	Nyvinmetsheath 22	3			
	Nyvin 22X	31			
20/T5510 *	Nyvin 16X	3	Table 2	Power unit 2C	Socket 1020; T.B.1738; T.B.1739; T.B.1752
	Nyvinmetsheath 22X	2			
21/T5510	Nyvin 22	6	A B C D E F	J.B. plug 1210	Aerial switch plug break
22/T5510	Nyvin 22	6	A B C D E F	Waveguide switch 8A	J.B. plug 1209
23/T5510 *	Nyvin 22	9	Table 2	J.B. plug 1210	Test socket A; T.B.1739; T.B.1752
	Nyvin 20	3			
24/T5510 *	Nyvinmetsheath 22	25	Table 2	Receiver 6G	Test socket 6G; T.B.1751 (Ends B1 & B2)
25/T5510	Nyvin 22	5	Refer to fig.10	Receiver 6H	T.B.1737

TABLE 1 (Cont'd)

Connectors for A.R.I.18146

Part No.	Cableform	No.of Cores	Wiring pin to pin End A to End B	Connecting End A	End B
26/T5510	Nyvin 22 Nyvinmetsheath 22	7 2	A B C D E I T F G Screens to shells	Power unit 2A	Receiver 6A
27/T5510	Uniradio 43	1	–	Power unit 2E	Receiver 6G
28/T5510	Nyvin 16 Nyvin 18 Nyvin 20 Nyvin 22	3 1 9 1	K L M R A B C D E F G H J N	Power unit 2M	Panel 109P
29/T5510	Nyvin 22	6		Panel 109P	T.B.1736 and 1737
30/T5510	Uniradio 70	1	Refer to fig.9	Receiver 6E	Blanking unit
31/T5510	Nyvin 22	5		Blanking unit	T.B.1736 and 1737
32/T5510	Nyvin 22 Nyvinmetsheath	9		Plug 894	T.B.1738; 1739 and 1752
33/T5510	Nyvin 22	17	A B C D E F G H J K L M N P R S T	Receiver 6B	Control frequency selector 3A
34/T5510	Uniradio 70	1	–	Tee piece rear	A.R.I.5952 scanner E
35/T5510	Uniradio 70	1	–	Tee piece rear	Blanking unit (Removed Mod.2304)
36/T5510	Uniradio 70	1	–	Blanking unit RS	Tee piece rear
37/T5510	Nyvin 22	6	A C D E F Earth to B End B	Plug break and earth	Aerial switch
38/T5510	Nyvin 22 Nyvinmetsheath 22	9 2	B C D E F G H J L A K Screens to M	Plug 174	Plug 894
41/T5510	Miniature 6C	6	Refer to fig.10 Screens to shells	J.B.1/T6158	Waveguide switch
42/T5510	Uniradio 70	1	–	Tee piece rear	Plug break 1243 (Post Mod.2304)
9/T4509	Miniature 25C	25	A–Z except I	Plug 646	Plug 1020
FR200/T3434	Flex copper cord 16/4,0048	1		T.B.1740	Earth
FR855/T3434	Nyvin 16	1		Fuse 664	T.B.1742
RF856/T3434	Nyvin 22 Nyvinmetsheath 22	9	Refer to fig.9	Plug 174	T.B.1741; T.B.1742
FR857/T3434	Nyvin 20	1		T.B.1740	T.B.1042
FR858/T3434	Nyvin 22	1		Fuse 1393	Relay 324
FR859/T3434	Nyvin 22	2		Relay 324	T.B.1752
FR871/T3434	Nyvin 20	2		Control unit 4D	T.B.1042
FR872/T3434	Nyvin 22	1		Relay 324	T.B.1739

TABLE 2

Connector wiring for A.R.I.18146

The following shows pin wiring for connectors wired differently at each end

7/T5510

Wiring End A to End B

A	–	A
G	–	B
H	–	C
J	–	D
K	–	E
L	–	F
M	–	G
N	–	H
P	–	J
R	–	K
E	–	L
T	–	M
U	–	N
V	–	O
W	–	P
X	–	Q
Z	–	R
a	–	S
b	–	T
c	–	U
d	–	V
e	–	W
f	–	X
g	–	V
h	–	Z
j	- T.B.1741 -	A
k	- T.B.1741 -	A
m	- T.B.1741 -	C
n	- T.B.1741 -	D
s		–
–	- T.B.1741 -	E

19/T5510

Wiring End A to End B

A	–	A
D	–	D
E	–	E
F	–	F
G	–	G
H	–	H
J	–	J
B	- T.B.1751 -	B
C	- T.B.1751 -	C
K	- T.B.1751 -	A
L		–
–	T.B.1751 -	E

End A
Screens on pins
B-C-K connected
to L

End B
Screens on T.B.
1751-B-C-A
connected to T.B.
1751-E

20/T5510

Wiring End A to End B

A	–	A
C	–	O
D	–	P
E	–	L
G	–	B
H	–	C
J	–	D
K	–	E
L	–	F
M	–	G
N	–	H
P	–	J
R	–	K
T	–	M
U	–	N
X	–	Q
Z	–	R
a	–	S
b	–	T
c	–	U
d	–	V
e	–	W
f	–	X
g	–	V
h	–	Z
j	- T.B.1738 -	E
k	- T.B.1739 -	A
m	- T.B.1738 -	A
s		–
–	- T.B.1739 -	C
n	- T.B.1738 -	B

23/T5510

Wiring End A to End B

A	–	A
D	–	D
E	–	E
F	–	F
G	–	G
J	–	J
L	–	L
N	–	N
P	–	P
B	- T.B.1739 -	D
C	- T.B.1752 -	A
M	- T.B.1752 -	B

24/T5510

Wiring End A to End B

A	–	A
B	–	B
C	–	C
D	–	D
E	–	E
F	–	F
G	–	G
H	–	H
J	–	J
K	–	K
L	–	L
M	–	M
N	–	N
P	–	P
R	–	R
U	–	U
Z	–	Z
r	–	r
s	–	s

End A to End B1

g	- T.B.1751 -	C
e	- T.B.1751 -	B
h	- T.B.1751 -	A
-	- T.B.1751 -	E

End B2 to End B

T.B.1751-C	g
T.B.1751-B	e
T.B.1751-A	h
T.B.1751-E	–

TABLE 2 (Cont'd)

7/T5510	19/T5510	20/T5510	23/T5510	24/T5510
Wiring End A to End B	Wiring End A to End B	Wiring End A to End B	Wiring End A to End B	Wiring End A to End B
p - T.B.1742 - A B - T.B.1742 - D D - T.B.1742 - E F - T.B.1742 - B r - T.B.1742 - C End A Screens on pins m-n connected to s End B Screens on T.B. 1741-C-E connected to T.B.1741-E		p - T.B.1739 - B F - T.B.1738 - C B - T.B.1738 - D S - T.B.1752 - B V - T.B.1739 - E W - T.B.1739 - D r - T.B.1752 - D End A Screens on pins k-m connected to s End B Screens on T.B. 1739-A and T.B. 1738A connected to T.B.1739-C		Ends A and B All screens connected to shells Ends B1 and B2 All Screens connected to T.B.1751-E

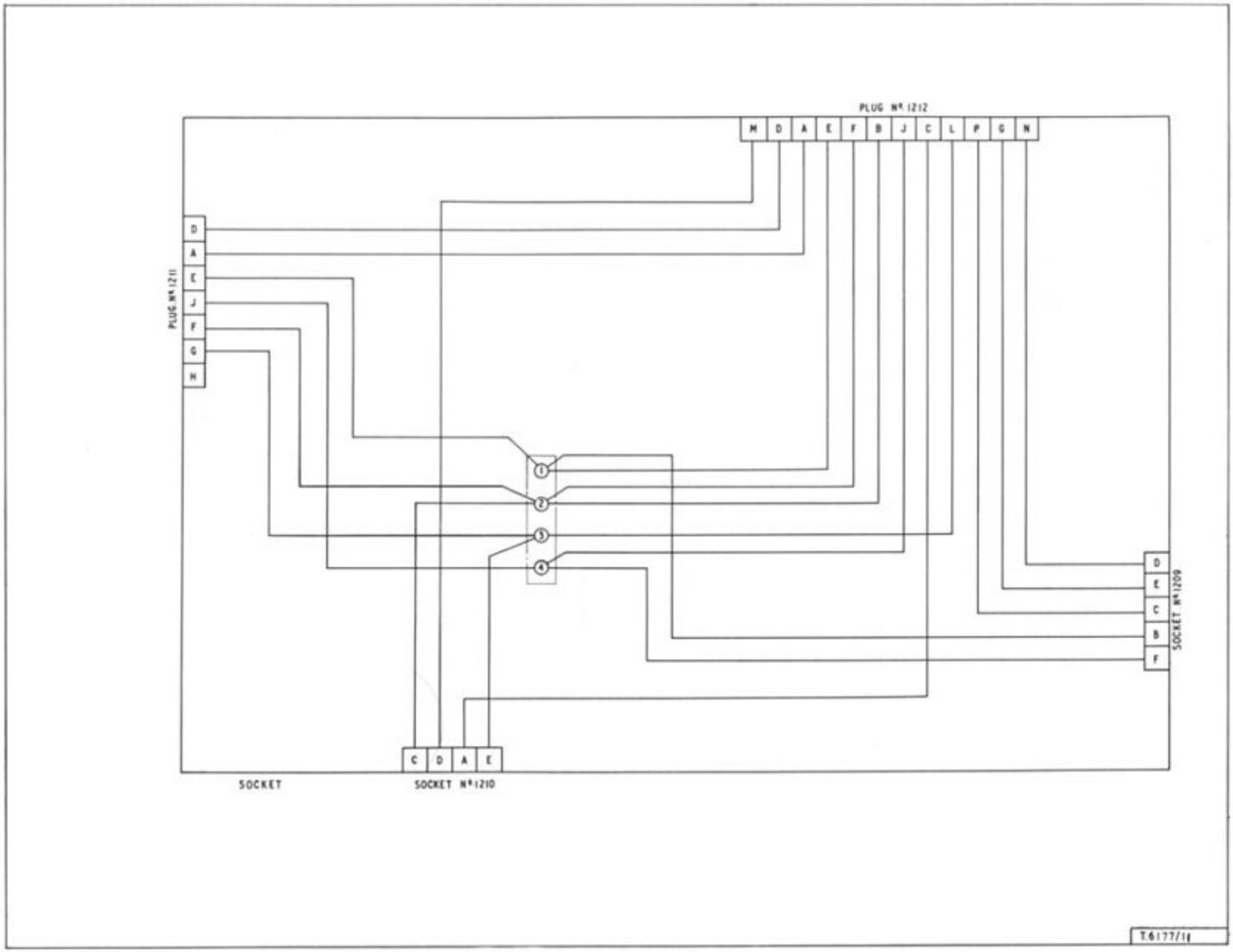

Fig. 7 Junction box wiring – Pre. Mod. 2369

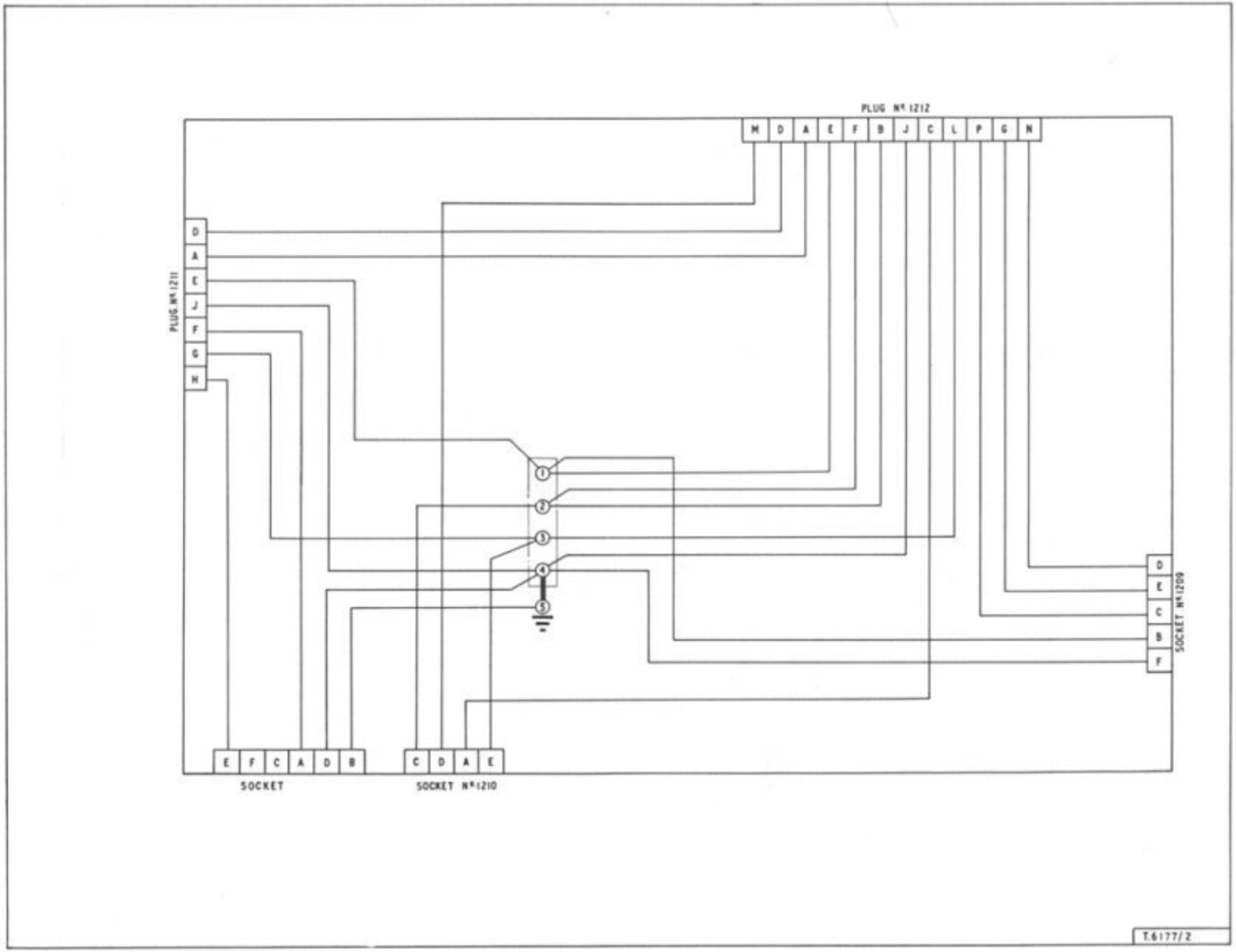

Fig. 8 Junction box wiring – Post Mod. 2369

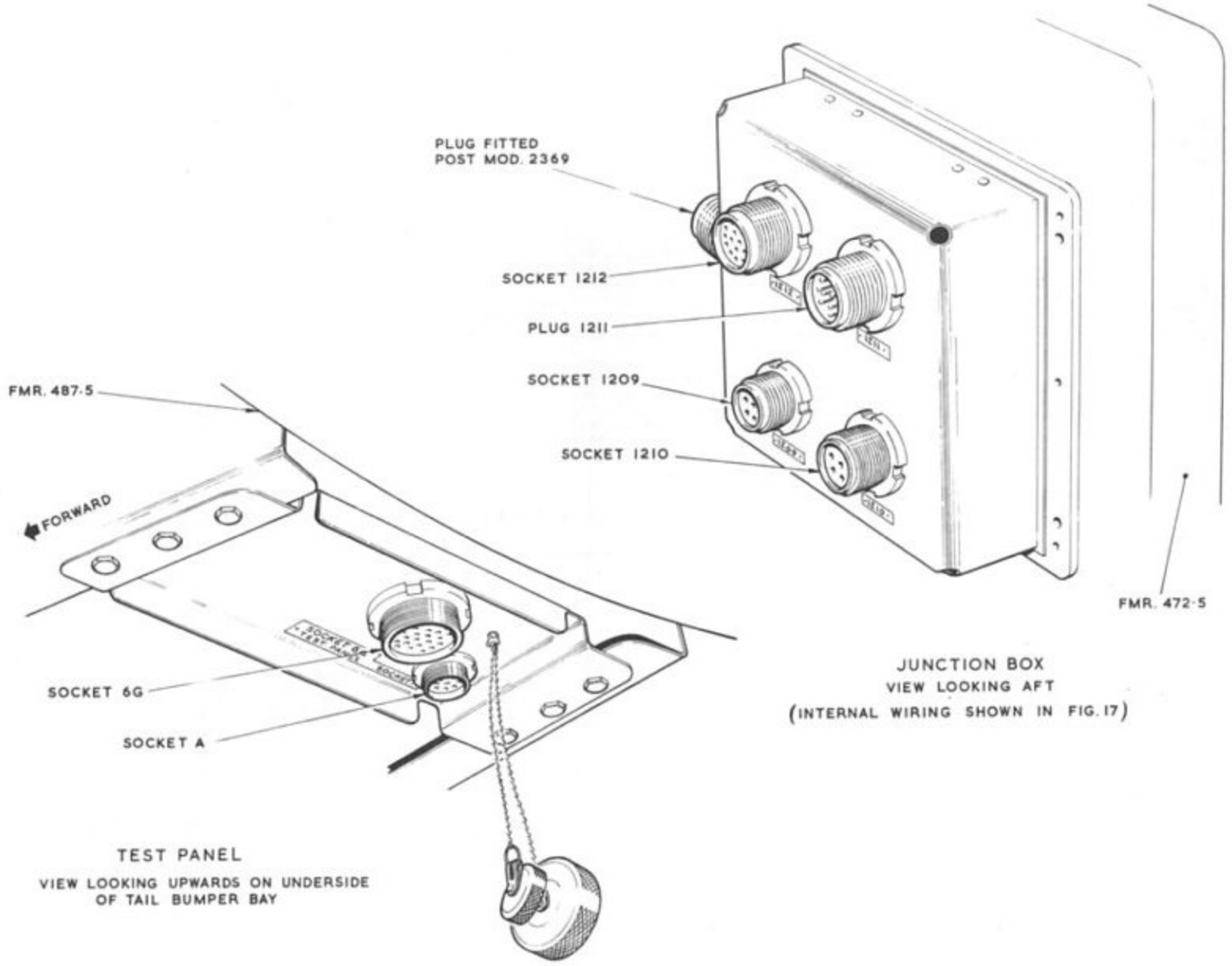

Fig. 9 Test panel and J/B 1/T6158

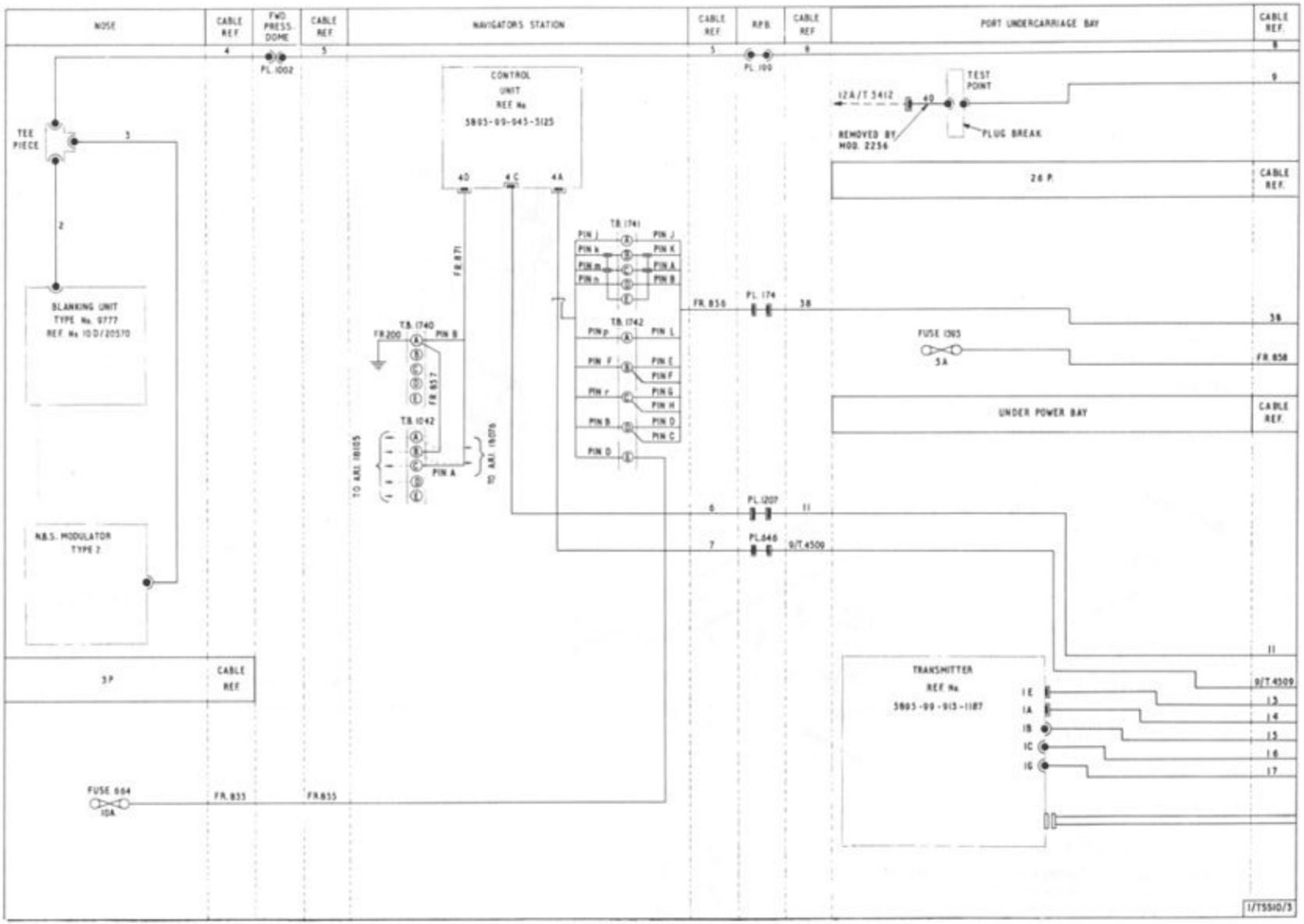

Fig. 10 (1) Routing chart for A.R.I. 18146 Pre. Mod. 2369 and 2304

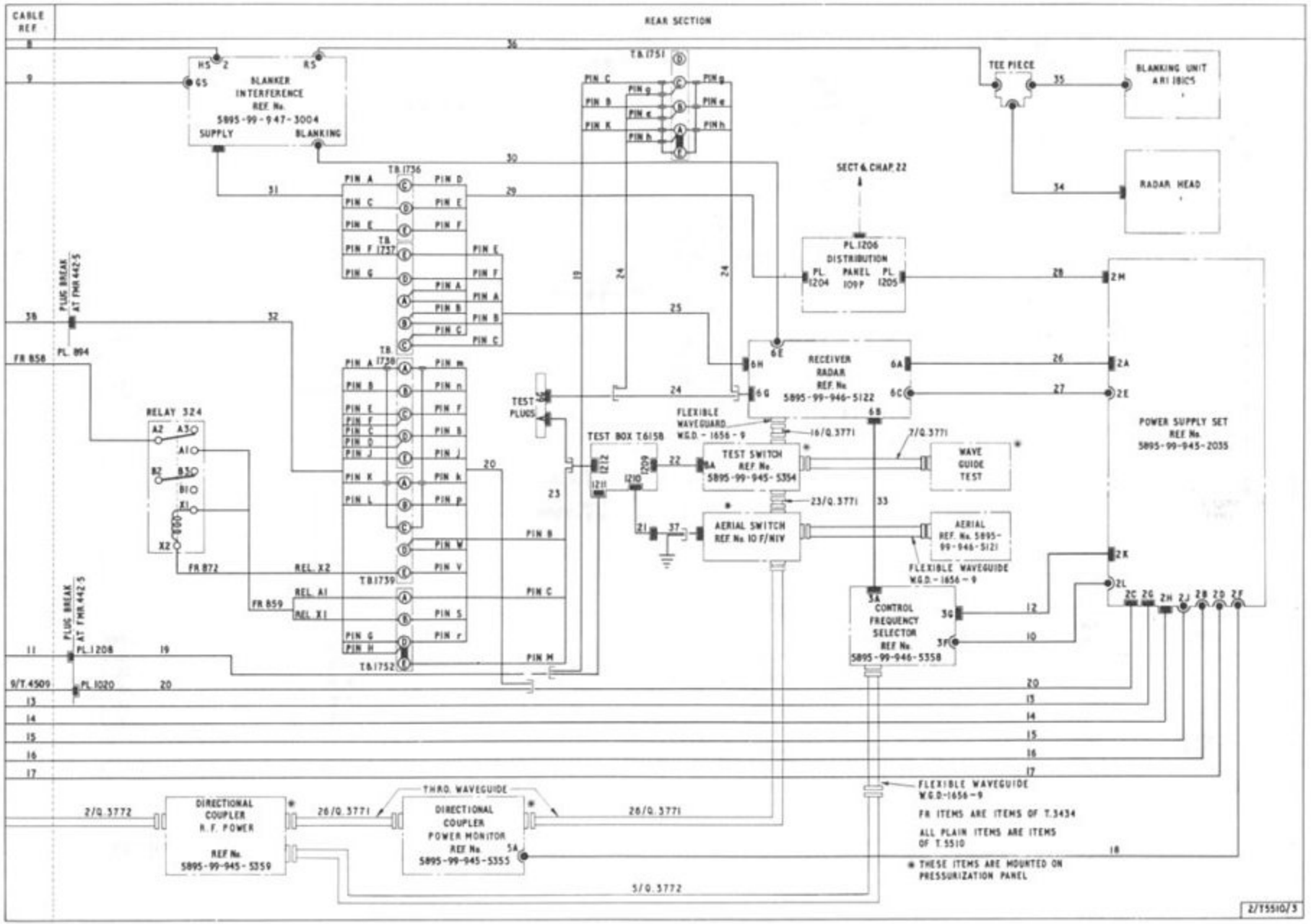

Fig. 10 (2) Routing chart for A.R.I. 18146 Pre.Mod. 2369 and 2304

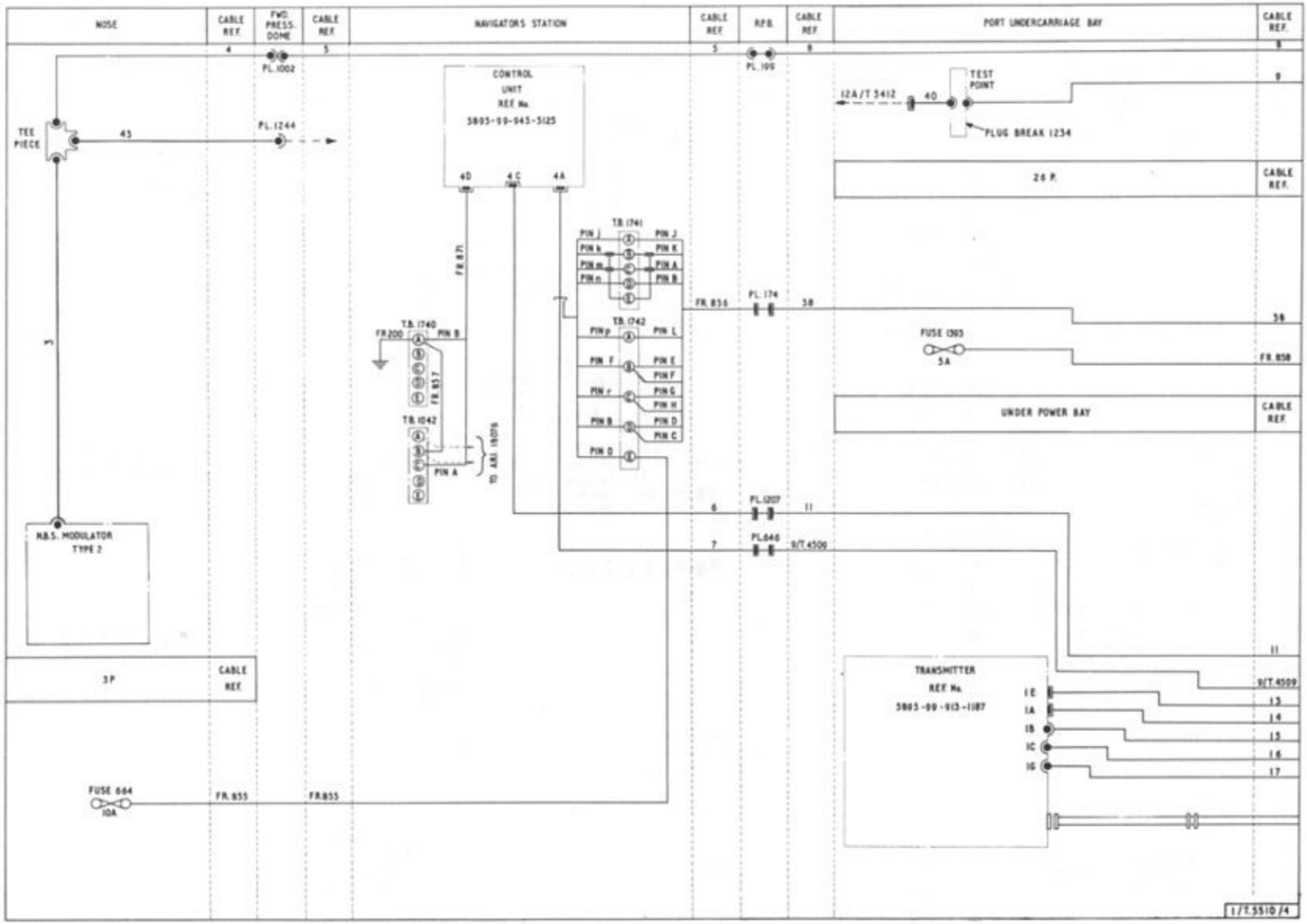

Fig. 11 (1) Routing chart for A.R.I. 18146 Post mod. 2369 and 2304

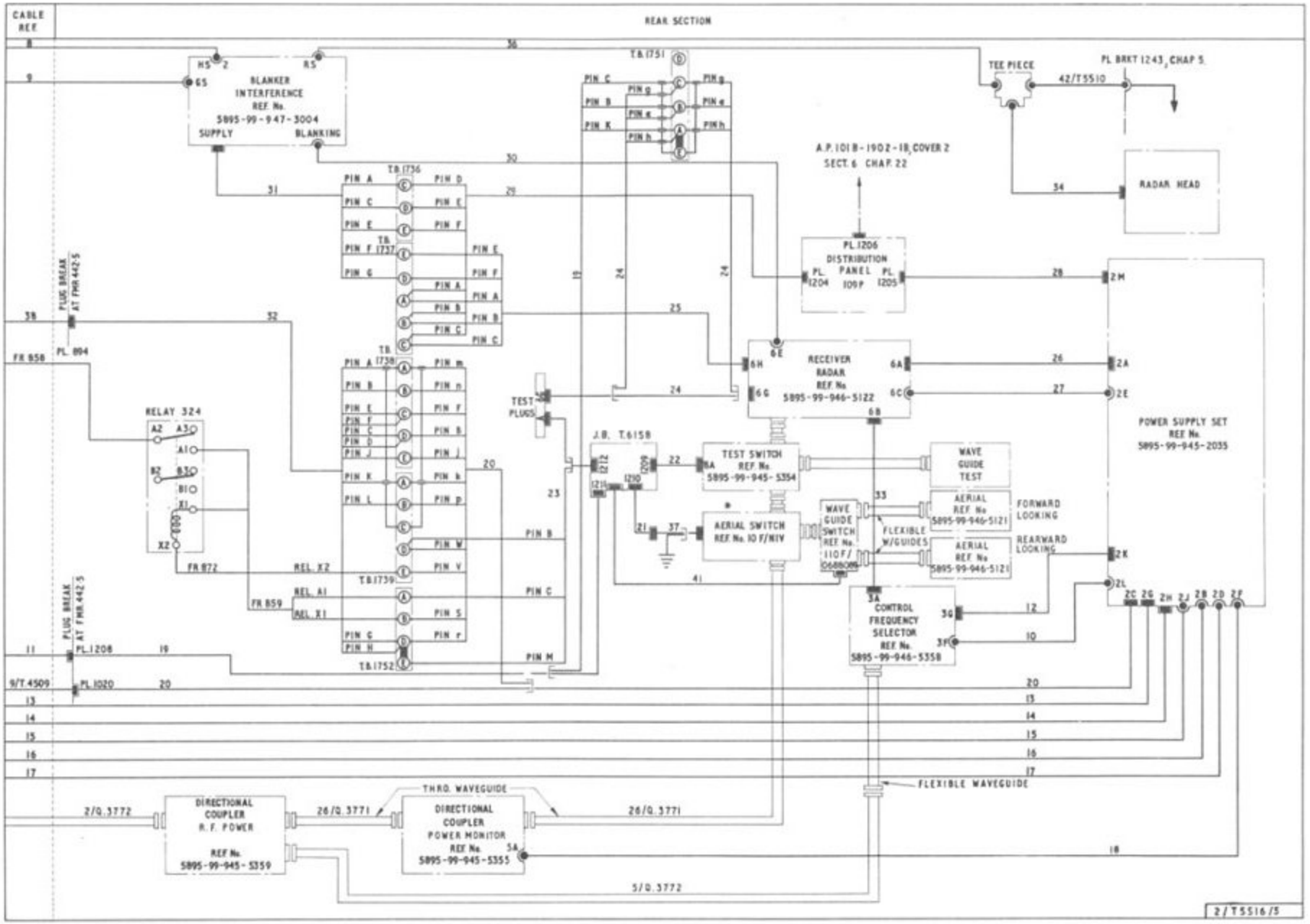

Fig 11(2) Routing chart for A.R.I. 18146 Post Mod. 2369 and 2304